PUBLIC INTEREST REVIEW FOR GROUND WATER APPLICATIONS

TO: Water Rights Section Date 6/15/2009

FROM: Ground Water/Hydrology Section Jen Woody/Josh Hackett
Reviewer's Name

SUBJECT: Application G- 17208 Supersedes review of _____
Date of Review(s)

PUBLIC INTEREST PRESUMPTION; GROUNDWATER

OAR 690-310-130 (1) *The Department shall presume that a proposed groundwater use will ensure the preservation of the public welfare, safety and health as described in ORS 537.525.* Department staff review ground water applications under OAR 690-310-140 to determine whether the presumption is established. OAR 690-310-140 allows the proposed use be modified or conditioned to meet the presumption criteria. **This review is based upon available information and agency policies in place at the time of evaluation**.

A. GENERAL INFORMATION: **Applicant's Name**: Deconinck/Prince Seeds, Inc **County:** **Marion**

A1. Applicant(s) seek(s) 0.27 cfs from 1 well(s) in the **Willamette** Basin, _____ subbasin Quad Map: St. Paul

A2. Proposed use: Irrigation Seasonality: March 1- October 31

A3. Well and aquifer data **(attach and number logs for existing wells; mark proposed wells as such under logid)**:

Well	Logid	Applicant's Well #	Proposed Aquifer*	Proposed Rate(cfs)	Location (T/R-S QQ-Q)	Location, metes and bounds, e.g. 2250' N, 1200' E fr NW cor S 36
1	MARI 59731		Alluvium	0.27	5S/2W-10 NW SE	950' S, 100' E fr NE cor DLC 79
2						
3						
4						
5						

* Alluvium, CRB, Bedrock

Well	Well Elev ft msl	First Water ft bls	SWL ft bls	SWL Date	Well Depth (ft)	Seal Interval (ft)	Casing Intervals (ft)	Liner Intervals (ft)	Perforations Or Screens (ft)	Well Yield (gpm)	Draw Down (ft)	Test Type
1	**178**	**84**	**14**	**04/28/2006**	**218**	**0-60**	**+1.33-89.33**	**n/a**	**91.5-141.5**	**1200**	**44.4**	**P**

Use data from application for proposed wells.

A4. **Comments:** _____

A5. ☒ **Provisions of the** Willamette Basin rules relative to the development, classification and/or management of ground water hydraulically connected to surface water ☐ **are**, *or* ☒ **are not**, activated by this application. (Not all basin rules contain such provisions.)
Comments: This well produces from a confined aquifer so the pertinent rules do not apply.

A6. ☐ **Well(s) #** _____ , _____ , _____ , _____ , _____ , tap(s) an aquifer limited by an administrative restriction.
Name of administrative area: _____
Comments: _____

B. GROUND WATER AVAILABILITY CONSIDERATIONS, OAR 690-310-130, 400-010, 410-0070

B1. **Based upon available data**, I have determined that ground water* for the proposed use:

a. ☐ **is** over appropriated, ☐ **is not** over appropriated, *or* ☒ **cannot be determined to be** over appropriated during any period of the proposed use. * This finding is limited to the ground water portion of the over-appropriation determination as prescribed in OAR 690-310-130;

b. ☐ **will not** *or* ☐ **will** likely be available in the amounts requested without injury to prior water rights. * This finding is limited to the ground water portion of the injury determination as prescribed in OAR 690-310-130;

c. ☐ **will not** *or* ☐ **will** likely to be available within the capacity of the ground water resource; or

d. ☒ **will, if properly conditioned**, avoid injury to existing ground water rights or to the ground water resource:
   i. ☒ The permit should contain condition #(s) 7B, 7C;
   ii. ☐ The permit should be conditioned as indicated in item 2 below.
   iii. ☐ The permit should contain special condition(s) as indicated in item 3 below;

B2. a. ☐ **Condition** to allow ground water production from no deeper than _____ ft. below land surface;

b. ☐ **Condition** to allow ground water production from no shallower than _____ ft. below land surface;

c. ☒ **Condition** to allow ground water production only from the Alluvial ground water reservoir ~~between approximately _____ ft. and _____ ft. below land surface~~;

d. ☐ **Well reconstruction** is necessary to accomplish one or more of the above conditions. The problems that are likely to occur with this use and without reconstructing are cited below. Without reconstruction, I recommend withholding issuance of the permit until evidence of well reconstruction is filed with the Department and approved by the Ground Water Section.

Describe injury –as related to water availability– that is likely to occur without well reconstruction (interference w/ senior water rights, not within the capacity of the resource, etc): _____

B3. **Ground water availability remarks:**

The applicant's well is located in an area that contains low permeability saturated silt and clay from land surface to a depth of approximately 80-100 feet. About 50 feet of productive sand and gravel underlie the low permeability silt. Over 400 feet of clay and silt with thin beds of sand and gravel underlie the sand and gravel. The applicant's well is open to water-bearing sands and gravels below a depth of 91 feet.

Water levels in nearby wells show no obvious declines (see attached hydrograph).

C. GROUND WATER/SURFACE WATER CONSIDERATIONS, OAR 690-09-040

C1. **690-09-040 (1):** Evaluation of aquifer confinement:

Well	Aquifer or Proposed Aquifer	Confined	Unconfined
1	**Alluvium**	☒	☐
		☐	☐
		☐	☐
		☐	☐
		☐	☐

Basis for aquifer confinement evaluation: The applicant's well produces from sands and gravels that are confined by about 84 feet of clay and silty clay. The static water level at this well rises above the water-bearing zone, which also indicates a confined environment.

C2. **690-09-040 (2) (3):** Evaluation of distance to, and hydraulic connection with, surface water sources. All wells located a horizontal distance less than ¼ mile from a surface water source that produce water from an unconfined aquifer shall be assumed to be hydraulically connected to the surface water source. Include in this table any streams located beyond one mile that are evaluated for PSI.

Well	SW #	Surface Water Name	GW Elev ft msl	SW Elev ft msl	Distance (ft)	Hydraulically Connected? YES	NO	ASSUMED	Potential for Subst. Interfer. Assumed? YES	NO
1	**1**	**Senecal Creek**	**164**	**155-175**	**5450**	☒	☐	☐	☐	☒
1	**2**	**East Champoeg Creek**	**164**	**125-145**	**5900**	☒	☐	☐	☐	☒
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐
						☐	☐	☐	☐	☐

Basis for aquifer hydraulic connection evaluation: Water table maps and static water levels at the applicant's well and nearby wells indicate groundwater highs are coincident with surface water elevations. However, over 70 feet of clay and silts separate the creek bed and the top of water-bearing sands and gravels, which suggests an inefficient hydraulic connection between the aquifer and the stream.

Water Availability Basin the well(s) are located within: **182:** WILLAMETTE R > COLUMBIA R - AB MOLALLA R
30200901: MILL CR > PUDDING R – AT MOUTH

C3a. **690-09-040 (4):** Evaluation of stream impacts for each well that has been determined or assumed to be **hydraulically connected and less than 1 mile** from a surface water source. Limit evaluation to instream rights and minimum stream flows that are pertinent to that surface water source, and not lower SW sources to which the stream under evaluation is tributary. Compare the requested rate against the 1% of 80% *natural* flow for the pertinent Water Availability Basin (WAB). If Q is not distributed by well, use full rate for each well. Any checked ☒ box indicates the well is assumed to have the potential to cause PSI.

Well	SW #	Well < ¼ mile?	Qw > 5 cfs?	Instream Water Right ID	Instream Water Right Q (cfs)	Qw > 1% ISWR?	80% Natural Flow (cfs)	Qw > 1% of 80% Natural Flow?	Interference @ 30 days (%)	Potential for Subst. Interfer. Assumed?
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐
		☐	☐			☐		☐		☐

C3b. **690-09-040 (4):** Evaluation of stream impacts by total appropriation for all wells determined or assumed to be **hydraulically connected and less than 1 mile** from a surface water source. **Complete only if Q is distributed among wells**. Otherwise same evaluation and limitations apply as in C3a above.

	SW #		Qw > 5 cfs?	Instream Water Right ID	Instream Water Right Q (cfs)	Qw > 1% ISWR?	80% Natural Flow (cfs)	Qw > 1% of 80% Natural Flow?	Interference @ 30 days (%)	Potential for Subst. Interfer. Assumed?
			☐			☐		☐		☐
			☐			☐		☐		☐
			☐			☐		☐		☐
			☐			☐		☐		☐

Comments: The water-bearing zones in the well are overlain by at least 80 feet of fine-grained sediments (Willamette Silt Unit of Gannett and Caldwell, 1998) along adjacent stream reaches. This results in a relatively inefficient connection between the productive beds and local streams. Modeling in similar situations in the area indicates that impacts are likely to be much less than 25% after 30 days for stream reaches within one mile of the well.

C4a. **690-09-040 (5):** Estimated impacts on **hydraulically connected surface water sources greater than one mile** as a percentage of the proposed pumping rate. Limit evaluation to the effects that will occur up to one year after pumping begins. This table encompasses the considerations required by 09-040 (5)(a), (b), (c) and (d), which are not included on this form. Use additional sheets if calculated flows from more than one WAB are required.

Non-Distributed Wells													
Well	SW#	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	**1**	**0 %**	**0 %**	**0.13 %**	**0.15 %**	**0.18 %**	**0.20 %**	**0.22 %**	**0.24 %**	**0.26 %**	**0.28 %**	**0 %**	**0 %**
Well Q as CFS		**0**	**0**	**0.27**	**0.27**	**0.27**	**0.27**	**0.27**	**0.27**	**0.27**	**0.27**	**0**	**0**
Interference CFS		**0**	**0**	**0.0004**	**0.0004**	**0.0005**	**0.0005**	**0.0006**	**0.0006**	**0.0007**	**0.0008**	**0**	**0**

Distributed Wells													
Well	SW#	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													
		%	%	%	%	%	%	%	%	%	%	%	%
Well Q as CFS													
Interference CFS													

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
(A) = Total Interf.	**0**	**0**	**0.0004**	**0.0004**	**0.0005**	**0.0005**	**0.0006**	**0.0006**	**0.0007**	**0.0008**	**0**	**0**
(B) = 80 % Nat. Q			**38.40**	**27.60**	**13.70**	**8.72**	**3.79**	**2.09**	**1.88**	**2.39**		
(C) = 1 % Nat. Q			**0.384**	**0.276**	**0.137**	**0.0872**	**0.0379**	**0.0209**	**0.0188**	**0.0239**		
(D) = (A) > (C)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
(E) = (A / B) x 100	**0 %**	**0 %**	**0.001%**	**0.001 %**	**0.004 %**	**0.006 %**	**0.016 %**	**0.029 %**	**0.13 %**	**0.033 %**	**0 %**	**0 %**

(A) = total interference as CFS; (B) = WAB calculated natural flow at 80% exceed. as CFS; (C) = 1% of calculated natural flow at 80% exceed. as CFS; (D) = highlight the checkmark for each month where (A) is greater than (C); (E) = total interference divided by 80% flow as percentage.

Basis for impact evaluation:

MARI 59731 is hydraulically connected to Senecal Creek, which is greater than one mile from the well.

Evaluation using the Hunt (2003) model indicates stream depletion by MARI 59731 will be less than 1% of natural stream flow at 80% exceedence during the entire irrigation season (see Hunt model parameters and output attachment). Aquifer and aquitard parameters were estimated using Conlon et al., (2005) values for the Willamette Valley Middle Sedimentary Unit and the overlying Willamette Silt.

C4b. **690-09-040 (5) (b) The potential to impair or detrimentally affect the public interest is to be determined by the Water Rights Section.**

C5. ☒ **If properly conditioned**, the surface water source(s) can be adequately protected from interference, and/or ground water use under this permit can be regulated if it is found to substantially interfere with surface water:

i. ☐ The permit should contain condition #(s) ;

ii. ☐ The permit should contain special condition(s) as indicated in "Remarks" below;

C6. **SW / GW Remarks and Conditions:**

References Used:

Conlon and others, 2005, Ground-water hydrology of the Willamette Basin, Oregon: U.S Geological Survey Scientific Investigations Report 2005-5168.

Gannett and Caldwell, 1998, Geologic framework of the Willamette lowland aquifer system, Oregon and Washington: U.S. Geological Survey Professional Paper 1424-A,

Woodward and others, 1998, Hydrogeologic framework of the Willamette lowland aquifer system, Oregon and Washington: U.S. Geological Survey Professional Paper 1424-B,

D. WELL CONSTRUCTION, OAR 690-200

D1. **Well #**: _____ **Logid:** _____

D2. **THE WELL does not meet current well construction standards based upon:**
- a. ☐ review of the well log;
- b. ☐ field inspection by _____;
- c. ☐ report of CWRE _____;
- d. ☐ other: (specify) _____

D3. **THE WELL construction deficiency**:
- a. ☐ constitutes a health threat under Division 200 rules;
- b. ☐ commingles water from more than one ground water reservoir;
- c. ☐ permits the loss of artesian head;
- d. ☐ permits the de-watering of one or more ground water reservoirs;
- e. ☐ other: (specify) _____

D4. **THE WELL construction deficiency is described as follows:** _____

D5. **THE WELL**
- a. ☐ **was**, *or* ☐ **was not** constructed according to the standards in effect at the time of original construction or most recent modification.
- b. ☐ I don't know if it met standards at the time of construction.

D6. ☐ **Route to the Enforcement Section.** I recommend withholding issuance of the permit until evidence of well reconstruction is filed with the Department and approved by the Enforcement Section and the Ground Water Section.

THIS SECTION TO BE COMPLETED BY ENFORCEMENT PERSONNEL

D7. ☐ Well construction deficiency has been corrected by the following actions: _____

_____ _____, 200____.
(Enforcement Section Signature)

D8. ☐ **Route to Water Rights Section (attach well reconstruction logs to this page).**

Water Availability Tables

WILLAMETTE R > COLUMBIA R - AB MOLALLA R

WILLAMETTE BASIN

Water Availability as of 6/2/2009

Watershed ID #: 182

Exceedance Level: 80%

Date: 6/2/2009

Time: 11:51 AM

Water Availability Calculation | Consumptive Uses and Storages | Instream Flow Requirements | Reservations | Water Rights | Watershed Characteristics

Water Availability Calculation

Monthly Streamflows in Cubic Feet per Second
Storage at 50% Exceedance in Acre-Feet

Month	Natural Stream Flow	Consumptive Uses and Storages	Expected Stream Flow	Reserved Stream Flow	Instream Flow Requirement	Net Water Available
JAN	21,400.00	2,250.00	19,100.00	0.00	1,500.00	17,600.00
FEB	23,200.00	7,440.00	15,800.00	0.00	1,500.00	14,300.00
MAR	22,400.00	7,220.00	15,200.00	0.00	1,500.00	13,700.00
APR	19,900.00	6,870.00	13,000.00	0.00	1,500.00	11,500.00
MAY	16,600.00	4,200.00	12,400.00	0.00	1,500.00	10,900.00
JUN	8,740.00	2,050.00	6,690.00	0.00	1,500.00	5,190.00
JUL	4,980.00	1,870.00	3,110.00	0.00	1,500.00	1,610.00
AUG	3,830.00	1,720.00	2,110.00	0.00	1,500.00	614.00
SEP	3,890.00	1,470.00	2,420.00	0.00	1,500.00	918.00
OCT	4,850.00	717.00	4,130.00	0.00	1,500.00	2,630.00
NOV	10,200.00	851.00	9,350.00	0.00	1,500.00	7,850.00
DEC	19,300.00	924.00	18,400.00	0.00	1,500.00	16,900.00
STO	15,200,000.00	2,250,000.00	13,000,000.00	0.00	1,090,000.00	11,900,000.00

MILL CR > PUDDING R - AT MOUTH
WILLAMETTE BASIN

Water Availability as of 6/5/2009

Watershed ID #: 30200901

Exceedance Level: 80%

Date: 6/5/2009

Time: 3:56 PM

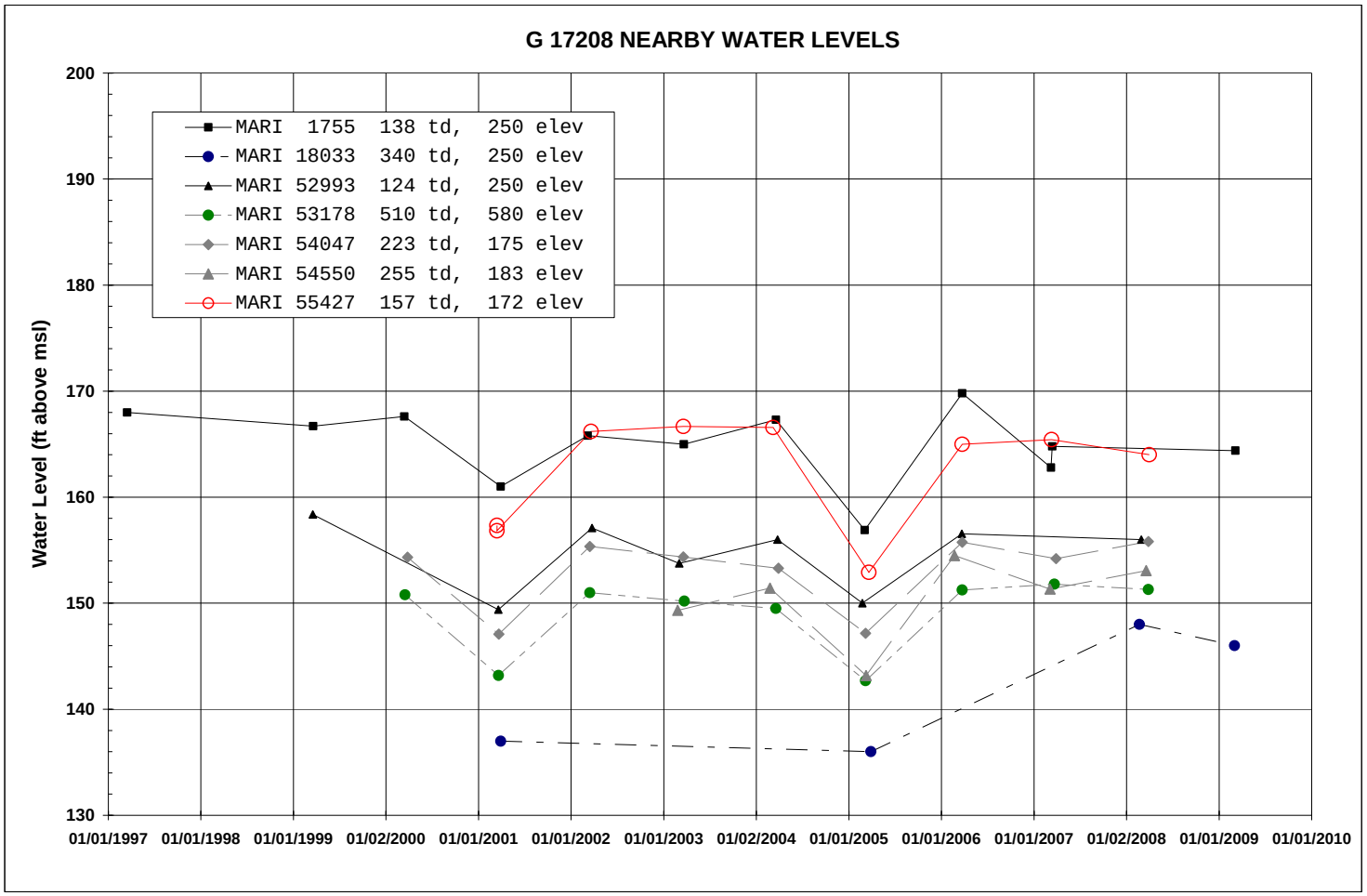
Water Availability Calculation | Consumptive Uses and Storages | Instream Flow Requirements | Reservations | Water Rights | Watershed Characteristics

Water Availability Calculation

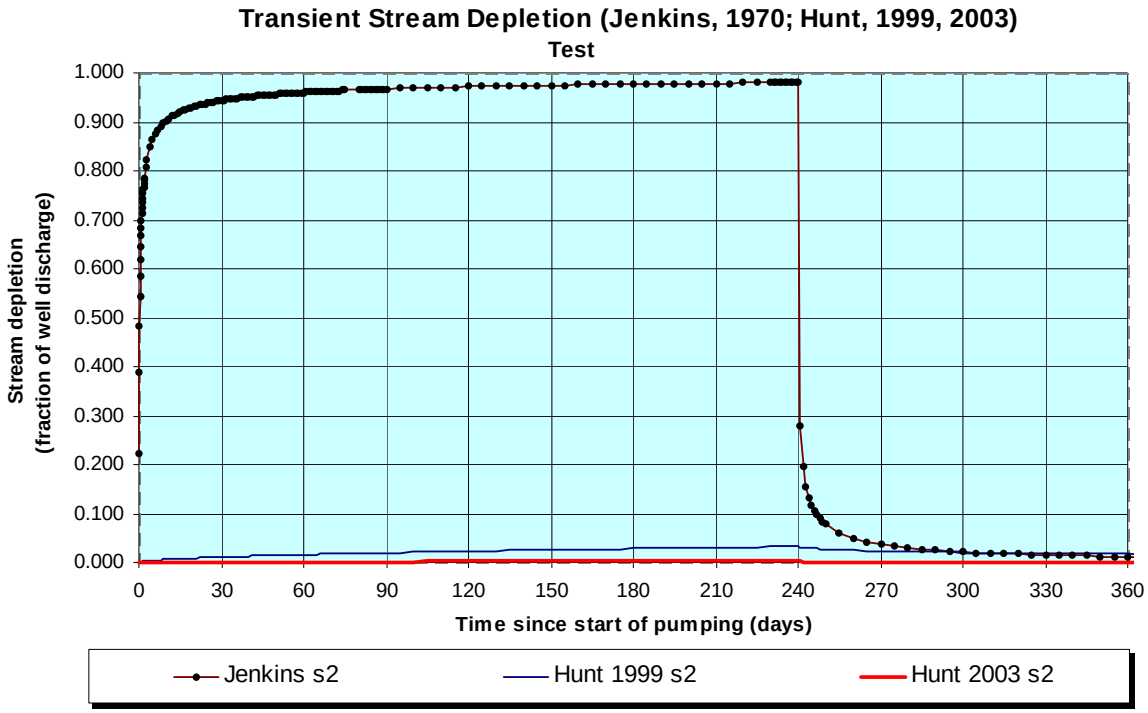
Monthly Streamflows in Cubic Feet per Second
Storage at 50% Exceedance in Acre-Feet

Month	Natural Stream Flow	Consumptive Uses and Storages	Expected Stream Flow	Reserved Stream Flow	Instream Flow Requirement	Net Water Available
JAN	39.20	10.40	28.80	0.00	0.00	28.80
FEB	53.90	10.50	43.40	0.00	0.00	43.40
MAR	38.40	10.10	28.30	0.00	0.00	28.30
APR	27.60	7.62	20.00	0.00	0.00	20.00
MAY	13.70	6.11	7.59	0.00	0.00	7.59
JUN	8.72	7.33	1.39	0.00	0.00	1.39
JUL	3.79	10.80	-7.01	0.00	0.00	-7.01
AUG	2.09	8.87	-6.78	0.00	0.00	-6.78
SEP	1.88	5.06	-3.18	0.00	0.00	-3.18
OCT	2.39	1.76	0.63	0.00	0.00	0.63
NOV	6.05	7.78	-1.73	0.00	0.00	-1.73
DEC	25.90	10.20	15.70	0.00	0.00	15.70
STO	30,000.00	5,820.00	25,000.00	0.00	0.00	25,000.00

Water Levels in Nearby Wells



Hunt Model (2003) Results and Parameters



Output for Stream Depletion, Scenerio 2 (s2):						Time pump on (pumping duration) = 240 days						
Days	30	60	90	120	150	180	210	240	270	300	330	360
J SD	94.4%	96.0%	96.8%	97.2%	97.5%	97.7%	97.9%	98.0%	3.7%	2.2%	1.5%	1.2%
H SD 1999	1.1%	1.6%	2.0%	2.3%	2.6%	2.9%	3.1%	3.3%	2.4%	2.1%	1.9%	1.7%
H SD 2003	0.13%	0.15%	0.18%	0.20%	0.22%	0.24%	0.26%	0.28%	0.17%	0.16%	0.16%	0.15%
Qw, cfs	0.270	0.270	0.270	0.270	0.270	0.270	0.270	0.270	0.270	0.270	0.270	0.270
H SD 99, cfs	0.003	0.004	0.005	0.006	0.007	0.008	0.008	0.009	0.006	0.006	0.005	0.005
H SD 03, cfs	0.000	0.000	0.000	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000

Parameters:		Scenario 1	Scenario 2	Scenario 3	Units
Net steady pumping rate of well	Qw	121.00	121.00	121.00	gpm
Time pump on (pumping duration)	tpon	240	240	240	days
Perpendicular from well to stream	a	5450	5450	5450	ft
Well depth	d	218	218	218	ft
Aquifer hydraulic conductivity	K	20	200	2	ft/day
Aquifer saturated thickness	b	50	50	50	ft
Aquifer transmissivity	T	1000	10000	100	ft*ft/day
Aquifer storativity or specific yield	S	0.0001	0.0001	0.0001	
Aquitard vertical hydraulic conductivity	Kva	0.01	0.01	0.01	ft/day
Aquitard saturated thickness	ba	84	84	84	ft
Aquitard thickness below stream	babs	50	50	50	ft
Aquitard porosity	n	0.01	0.01	0.01	
Stream width	ws	20	20	20	ft
Streambed conductance (lambda)	sbc	0.004000	0.004000	0.004000	ft/day
Stream depletion factor	sdf	2.970250	0.297025	29.702500	days
Streambed factor	sbf	0.021800	0.002180	0.218000	
input #1 for Hunt's Q_4 function	t'	0.336672	3.366720	0.033667	
input #2 for Hunt's Q_4 function	K'	3.536012	0.353601	35.360119	
input #3 for Hunt's Q_4 function	epsilon'	0.010000	0.010000	0.010000	
input #4 for Hunt's Q_4 function	lamda'	0.021800	0.002180	0.218000	

Well Location Map